

## CLAIMS

What is claimed is:

1. A flash memory, comprising:  
a first boot zone storing a first booting program;  
a second boot zone storing a duplicate of the first booting program, as a second booting program; and  
a data zone storing an executable firmware program,  
wherein one of the first and second booting programs is executed based on whether an error is detected in either of the first or second boot zones.
2. A memory protection apparatus, of an AT Attachment Packet Interface (ATAPI) drive for storing an executable firmware program, downloaded from a host, the apparatus comprising:  
a storage unit having a first boot zone storing a first booting program, a second boot zone storing a duplicate of the first booting program, as a second booting program, and a data zone storing the firmware program; and  
a controller checking for a presence of an error in the first and/or second booting zones when the ATAPI drive is initialized, executing one of the first booting program and the second booting program based on whether the first or second boot zones include an error, and controlling execution of the firmware program.
3. The apparatus of claim 2, wherein the controller detects and corrects for an error in the second boot zone while executing the first booting program, when no error is detected in the first boot zone.
4. The apparatus of claim 3, wherein data stored in the first boot zone, which has no error, is used as a basis for the detection and correction of the error in the second boot zone.
5. The apparatus of claim 2, wherein the controller corrects for an error in the first boot zone while executing the second booting program, when the error is detected in the first boot zone.

6. The apparatus of claim 5, wherein data in the second boot zone, which has no error, is used as a basis for the correction of the error in the first boot zone.

7. The apparatus of claim 2, wherein the controller further comprises a switching unit switching the second boot zone on, so as to jump to the second boot zone during the initialization of the ATAPI drive to execute the second booting program.

8. The apparatus of claim 2, wherein the host is a computer and the ATAPI drive and the computer communicate using an ATAPI protocol.

9. A method of operating an ATAPI drive for storing an executable firmware program downloaded from a host, the method comprising:

detecting for an error in a first boot zone of a memory, storing a first booting program, and a second boot zone of the memory, storing a duplicate of the first booting program, as a second booting program, when the ATAPI drive is initialized;

executing one of the first and second booting programs based on whether the first boot zone or the second boot zone includes an error; and

accessing the data zone of the memory in which the firmware program is stored and executing the firmware program after the executed one booting program.

10. The method of claim 9, wherein during the executing of the one booting program, an error in the second boot zone is corrected for, while executing the first booting program in the first boot zone, which has no error.

11. The method of claim 10, wherein data in the first boot zone, which has no error, is used as a basis for the detection and correction of the error in the second boot zone.

12. The method of claim 9, during the executing of the one booting program, an error in the first boot zone is corrected for, while executing the second booting program in the second boot zone, which has no error.

13. The method of claim 12, wherein data in the second boot zone, which has no error is used as a basis for the detection and correction of the error in the first boot zone.

14. The method of claim 9, further comprising communicating between the host, which is a computer, and the ATAPI drive using an ATAPI protocol.

15. A flash memory, comprising:  
a first memory having a first boot zone storing a first booting program and a second boot zone storing a duplicate of the first booting program, as a second booting program; and  
a second memory having a data zone storing an executable downloaded firmware program,  
wherein one of the first and second booting programs is executed based on an error being detected in the first boot zone or the second boot zone.

16. The flash memory of claim 15, wherein the firmware program is downloadable from a computer using an ATAPI protocol.

17. A memory protection apparatus, including an ATAPI drive for storing an executable firmware program downloaded from a host, the apparatus comprising:  
a first storage unit having a first boot zone storing a first booting program and a second boot zone storing a duplicate of the first booting program, as a second booting program;  
a second storage unit storing the firmware program; and  
a controller detecting for an error in one of the first and second boot zones when the ATAPI drive is initialized, executing the first booting program or the second booting program based on whether the one boot zone is the first boot zone or the second boot zone, and controlling execution of the firmware program stored in the data zone of the second storage unit.

18. The apparatus of claim 17, wherein the controller detects and corrects for an error in the second boot zone while executing the booting program in the first boot zone, when no error is detected in the first boot zone.

19. The apparatus of claim 18, wherein data in the first boot zone, which has no error, is used as a basis for the detection and correction of the error in the second boot zone.

20. The apparatus of claim 17, wherein the controller corrects for an error in the first boot zone while executing the second booting program in the second boot zone, when the error is detected in the first boot zone.

21. The apparatus of claim 20, wherein data in the second boot zone, which has no error, is used as a basis for the correction of the error in the first boot zone.

22. The apparatus of claim 17, wherein the controller further comprises a switching unit switching the second boot zone on, so as to jump to the second boot zone, during the initialization of the ATAPI drive, to execute the second booting program.

23. The apparatus of claim 17, further comprising a computer, as the host, with the ATAPI drive and the computer communicating using an ATAPI protocol.

24. A method of operating an ATAPI drive, storing an executable firmware program downloaded from a host, the method comprising:

detecting for an error in first and second boot zones of a first storage unit when the ATAPI drive is initialized, the first boot zone storing a first booting program and the second boot zone storing a duplicate of the first booting program, as a second booting program;

executing one of the first and second booting programs based on whether the corresponding first or second boot zone has no error; and

accessing a data zone of a second storage unit, storing the firmware program, and executing the firmware program after the execution of the one booting program.

25. The method of claim 24, wherein during the executing of the one booting program, an error in the second boot zone is corrected for, while executing the first booting program, which has no error.

26. The method of claim 25, wherein data in the first boot zone, which has no error, is used as a basis for the detection and correction of an error in the second boot zone.

27. The method of claim 24, wherein during the executing of the one booting program, an error in the first boot area is corrected for, while executing the second booting program, which has no error.

28. The method of claim 27, wherein data in the second boot zone, which has no error, is used as a basis for the correction of the error in the first boot zone.

29. The method of claim 24, wherein the host is a computer and the ATAPI drive and the computer communicate using an ATAPI protocol.

30. A storage system, comprising:  
a first memory storing more than one booting program;  
a second memory storing a firmware program for the storage system, separately addressable from the first memory; and  
a controller checking for a presence of an error in a first memory portion, of the first memory, when a storage drive containing the first memory is initialized, executing a first booting program, stored in the first memory portion, if no error is detected in the first memory portion, and executing a different booting program stored in a different memory portion of the first memory, if the error is detected in the first memory portion, and executing the firmware program after executing a booting program.

31. The storage system of claim 30, wherein the first memory is divided into separately addressable memory portions, including the first memory portion, with at least two memory portions including booting programs.

32. The storage system of claim 30, wherein the controller detects and corrects for an error in a second memory portion while executing the first booting program, when no error is detected in the first boot zone.

33. The storage system of claim 32, wherein data stored in the first memory portion, which has no error, is used as a basis for the detection and correction of the error in the second memory portion.

34. The storage system of claim 33, wherein a booting program of the second memory portion is replaced by the first booting program during the correction of the error in the second memory portion.

35. The storage system of claim 30, wherein the controller detects and corrects for an error in the first memory portion while executing a second booting program from a second memory portion, when no error is detected in the second memory portion.

36. The storage system of claim 35, wherein data stored in the second memory portion, which has no error, is used as a basis for the correction of the error in the first memory portion.

37. The storage system of claim 36, wherein the first booting program of the first memory portion is replaced by the second booting program during the correction of the error in the first memory portion.

38. The storage system of claim 30, further comprising a host communicating to the second memory to store the firmware in the second memory.

39. The storage system of claim 38, wherein the first and second memories are in an AT Attachment Packet Interface (ATAPI) drive and the host is a computer communicating with the ATAPI drive using an ATAPI protocol.